DOCUMENT RESUME

ED 480 815 PS 031 549

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TITLE	Early Care and Education in Massachusetts Public School Preschool Classrooms. A Report on the Findings from the Massachusetts Cost and Quality Study.
INSTITUTION	Wellesley Coll., MA. Center for Research on Women.
SPONS AGENCY	Massachusetts State Dept. of Education, Malden.; Abt Associates, Inc., Washington, DC.
PUB DATE	2002-00-00
NOTE	54p.; For the first report, see PS 030 115.
AVAILABLE FROM	Center for Research on Women, Wellesley Centers for Women, 106 Central Street, Wellesley, MA 02481 ($5). Tel: 781-283-2500; Fax: 781-283-2504; Web site: http://www.wellesley.edu.
PUB TYPE	Reports - Research (143)
EDRS PRICE	EDRS Price MF01/PC03 Plus Postage.
DESCRIPTORS	Classroom Environment; Costs; *Educational Quality; Expenditure per Student; Inclusive Schools; Language Acquisition; *Preschool Education; *Public Schools; Social Development; Special Needs Students; Teacher Student Relationship
IDENTIFIERS	Massachusetts; Program Characteristics; School Based Services

ABSTRACT

Massachusetts has a comprehensive system of early care and education that provides preschool programs for over 165,000 children, an estimated 27,600 of which attend preschool programs administered by public school systems. The second phase of the Massachusetts Cost and Quality Study examined 95 school-based, publicly administered preschool classrooms to determine characteristics, the quality of care and education, whether the quality varies by the family income of the children being served, what characteristics are linked to the quality of the school-based preschool classrooms, and the costs of public preschool education in public schools. Overall findings of this second phase of the study can be summarized as follows: (1) school-based, publicly administered preschool classrooms fill a particular niche in the early care and education market; (2) most of Massachusetts' publicly-administered preschool classrooms provide early care and education that meets or exceeds national standards for good quality; (3) three-quarters of the classrooms met or exceeded the Good benchmark on language and reasoning stimulation, and 87 percent met or exceeded the Good benchmark on social interactions; (4) the level of quality for public-school preschool programs serving lower income children was comparable to that of other public school programs in Massachusetts; (5) while the majority of the programs provide quality early care and education, there is room for improvement in opportunities for outdoor play and in meeting staff needs; (6) additional teacher training in early childhood education, beyond their formal education, such as the training provided by the Community Partnerships Children program, raises the level of language-reasoning stimulation provided to children in a given classroom; (7) teachers in classrooms with fewer children, as well as better ratios of children to instructional staff,

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provided greater warmth and sensitivity and greater teacher engagement with children; (8) classrooms that were NAEYC-accredited scored higher on both stimulation and warmth and sensitivity; (9) the majority of these preschool classrooms were inclusive classrooms, service both children with special needs and children without, and quality did not vary with the types of special education services offered, or the specific diagnoses of the children with special needs; and (10) per pupil expenditures in these inclusive preschool classrooms are estimated at $11,187 per year, or $21.68 per child hour, for preschool children with special needs and $3,236 per year or $6.27 per child hour, for children in the regular education program. (Contains 21 references.) (BTH)

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A report on the findings from
The Massachusetts Cost and Quality Study
Funded by the Massachusetts Department of Education

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Early Care and Education in Massachusetts Public School Preschool Classrooms

A report on the findings from the second phase of
The Massachusetts Cost and Quality Study

By Nancy L. Marshall, Cindy L. Creps, Nancy R. Burstein, Frederic B. Glantz, Wendy Wagner Robeson, Steve Barnett, Jennifer Schimmenti, Nancy Keefe

Funded by the Massachusetts Department of Education

Acknowledgements

The research team would like to recognize the work of the Data Collection Advisory Committee in supporting the development of the Massachusetts Cost and Quality Study; their comments on the study at various stages were invaluable and we look forward to future collaborative efforts. However, any errors in this report are solely the responsibility of the authors. Members of this Advisory Committee include state and federal agencies, local Child Care Resource and Referral Agencies, local Community Partnership Council coordinators, early childhood coordinators, higher education institutions, legislative aides and other interested individuals; members during the planning and implementation of this study are listed below. The authors also wish to thank Suzanne Helburn and Carollee Howes for their assistance, as well as our contacts at the Department of Education, Elisabeth Schaefer, Jason Sachs, Alice Barton and Barbara Gardner. We would also like to thank the administrators, teachers and other staff of the schools who participated in this study, and gave freely of their time and information.

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Citation: Nancy L. Marshall, Cindy L. Creps, Nancy R. Burstein, Frederic B. Glantz, Wendy Wagner Robeson, Steve Barnett, Jennifer Schimmenti, Nancy Keefe. 2002. *Early Care and Education in Massachusetts Public School Preschool Classrooms: Executive Summary*. Wellesley Centers for Women and Abt Associates Inc.

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Preface

The message emanating from brain research and research on early care and education programs is clear: quality early experiences have a positive impact on the development of a young child, and contribute to greater school readiness. Providing early educational, emotionally supportive and nurturing experiences are vital in order for children to develop successfully.

There are over 165,000 children in early education and care programs in Massachusetts. The Commonwealth's substantial investment of over $500 million in early childhood education, coupled with the high numbers of children in early care and education programs, makes understanding the quality of early care and education imperative, both to children's welfare and for planning effective state investments.

In 2000, the Department of Education, Early Learning Services, contracted with Wellesley College Center for Research on Women and Abt Associates to conduct a study of the cost and quality of early care and education in Massachusetts. The first report from this study, addressing early care and education for preschool-aged children in full-day, year-round centers, was released in 2001. We are pleased to now release the **second report** from this study, on the quality of early care and education in school-based, publicly-administered preschool classrooms. Future reports will address early care and education for infants and toddlers in full-day, year-round centers, as well as early care and education in family child care homes.

Early Care and Education in Massachusetts Public School Preschool Classrooms:

Executive Summary

Overview

Recent research on brain development, coupled with rising concerns about school readiness, has fueled an interest in the ways in which early care and education (ECE) can support young children's cognitive and language development. The research on ECE clearly indicates that preschool classrooms can play an important role. Children who attend high quality ECE programs, particularly those programs that offer greater language stimulation, show more advanced cognitive and language development (Burchinal, Roberts, Riggins et al, 2000; NICHD ECCRN 2000).

The early years are also crucial years for the development of social skills – the ability to make friends, to get along well with others, to cooperate in group activities, to understand others' perspectives – skills that are necessary to the development of self-esteem and social relationships, and to later school success. Research has found that higher quality ECE is associated with young children's social and emotional development (c.f., Lamb 1998). The quality and stability of children's relationships with their child care providers appears to be particularly important to children's social and emotional development (c.f., Howes & Hamilton 1992, 1993; Howes, Matheson & Hamilton 1994).

The cumulative evidence of the research on early care and education and children's development is clear; quality is consistently associated with children's development. As the National Research Council notes (2000, pg. 313), "...high-quality care is associated with outcomes that all parents want to see in their children, ranging from cooperation with adults to the ability to initiate and sustain positive exchanges with peers, to early competence in math and reading."

Massachusetts has a comprehensive system of early care and education that provides preschool programs for over 165,000 children. This ECE system includes non-profit and for-profit child care centers and nursery schools offering preschool programs, as well as preschool classrooms administered by public school systems. An estimated 27,600 children in Massachusetts attend preschool in public schools, about 18% of all children attending preschool programs (MA DOE 2001). These public school preschool classrooms are administered either by the schools themselves, and therefore under the purview of the Massachusetts Department of Education, or by private organizations (such as child care agencies), and therefore required to be licensed by the Massachusetts Office of Child Care Services. <u>This report focuses only on those preschool classrooms that are administered by the public schools themselves</u>.

Research Questions

This report addresses five research questions:

- What are the characteristics of publicly-administered, school-based preschool classrooms in Massachusetts?
- What is the quality of early care and education in these classrooms?
- Does the quality of early care and education vary by the family income of the children served?
- What classroom characteristics are linked to the quality of early care and education in school-based preschool classrooms?
- What are the costs of public preschool education in the public schools?

This report presents the findings from the second phase of the Massachusetts Cost and Quality Study, which examined the quality of early care and education in school-based, publicly-administered preschool classrooms. The report is based on data from 95 such classrooms, randomly selected from a list of all schools housing preschool classrooms, as reported to the Department of Education by school districts from around the state. Preschool programs that were administered by private organizations and licensed by the Office of Child Care Services, although located in school buildings, were not included in the sample frame. Each classroom was observed by trained observers; program coordinators were interviewed by trained interviewers.

This study was designed to provide an accurate, up-to-date picture of the quality of early care and education services for preschoolers attending these classrooms. This study was ***not*** designed to evaluate the effectiveness of specific regulations, subsidies or other policies. Nor was it designed as an evaluation of the special education component of the classrooms. Answers to these and other questions would require a different study design than that used to provide this snapshot of early care and education for preschoolers in Massachusetts public schools.

Summary of Results

The overall findings of this second phase of the Massachusetts Cost and Quality Study can be summarized in a few points.

- ***School-based, publicly-administered preschool classrooms fill a particular niche in the early care and education market.***

  Inclusive classrooms. These preschool classrooms were sometimes funded out of the regular education budget, or with Community Partnerships for Children funds, Title I funds or other grant funding. However, most of the preschool classrooms in

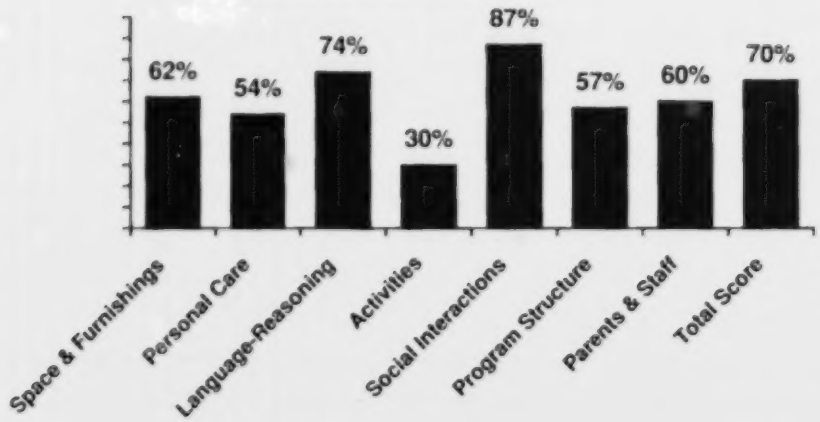
the randomly selected schools were supported by Special Education funds. Special education funds support a range of programs, including inclusive classrooms, that is, classrooms that serve both regular education students and special education students. Inclusive preschool classrooms are expected to serve no more than 15 children at a time, and to include both children without identified special needs and up to 7 children with special needs. In our sample of schools housing publicly-administered preschool classrooms, we found that 90% of the preschool sessions were in inclusive classrooms.

Part-day, part-week sessions.[1] Most of the observed preschool sessions operated part-day, and the majority operated part-week (fewer than five days per week). On average, sessions operated for 14.32 hours per week. Only 12% of all the sessions in the selected schools were full-day (at least five hours a day).

Staffing. Each classroom had one primary teacher, with one or more instructional aides. In addition, inclusive classrooms (most of the sample) also had one or more specialists working with the classroom children for a combined average of 6.68 hours per week. The most common specialists were speech therapists (in 83% of the classrooms) and physical therapists (in 79% of the classrooms). Some classrooms also had children who had individual aides.

- ***Most of Massachusetts' publicly-administered preschool classrooms provide early care and education that meets or exceeds national standards for good quality.***

Figure 1: Percent of Classrooms Meeting the Good Benchmark on ECERS-R Scales



The Early Childhood Environment Rating Scale, used in this study, is a nationally-used observational measure that provides benchmarks for different levels of quality. These benchmarks are labeled Inadequate, Minimally Adequate, Good and Excellent.

[1] Many preschool classrooms operated more than one session, serving different children in each session. For example, one classroom could operate a Monday/Wednesday/Friday morning session, a separate Monday/Wednesday/Friday afternoon session, a Tuesday/Thursday morning session and a separate Tuesday/Thursday afternoon session.

- ***Three-quarters of the classrooms met or exceeded the Good benchmark on language and reasoning stimulation, and 87% met or exceeded the Good benchmark on social interactions.***

  This high level of stimulation and social interactions reflects, in part, the standards for teacher education in Massachusetts – every public school preschool teacher must have a 4-year degree, and 67% of the teachers in this sample had a master's degree.

- ***The level of quality for public school preschool programs serving lower income children was comparable to that of other public school programs in Massachusetts.***

  We compared programs in which 50% or more of the preschool children participated in the Child and Adult Care Food Program with programs with fewer or no children participating.[2] We found no significant differences in the quality of early care and education received by children in high-participation programs compared to children in other programs in Massachusetts.

- ***While the majority of the programs provide quality early care and education, there is room for improvement in opportunities for outdoor play and in meeting staff needs.***

  More than half of the classrooms did not meet the Good benchmark on the availability of periods of free play both indoors and outdoors, weather-permitting, as well as both gross motor and less active play daily.

  More than half of the classrooms did not meet the Good benchmark on provisions for the personal needs of staff (such as breaks and space for personal belongings), and opportunities for professional growth. However, the majority of classrooms met or exceeded the Good benchmarks for provisions for supervision and evaluation of staff, on the provisions for the professional needs of staff (space for storage, meetings, program administration), and on staff interaction and cooperation.

- ***Additional teacher training in early childhood education, beyond their formal education, such as the training provided by the Community Partnerships Children program, raises the level of language-reasoning stimulation provided to children in a given classroom.***

  While all preschool teachers are required to have at least a 4-year degree, we found that those teachers who had received additional training in early childhood education were more likely to provide the levels of stimulation associated with greater school readiness.

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[2] Children in families below 185% of the poverty line are eligible for the Food Program; as such, participation serves as a proxy measure of children's family income.

- ***Teachers in classrooms with fewer children, as well as better ratios of children to instructional staff, provided greater warmth and sensitivity and greater teacher engagement with the children.***

  Teacher education and training are not enough to increase the levels of engagement, warmth and sensitivity. When teachers are responsible for fewer children, they are more likely to be able to spend time with an individual child and to be warm and sensitive to children's needs.

- ***Classrooms that were NAEYC-accredited scored higher on both stimulation and on warmth and sensitivity.***

  NAEYC accreditation[3] is an important indicator of the quality of early care and education offered in publicly-administered, school-based preschool classrooms. Knowing that a program is NAEYC-accredited provides policymakers and consumers with additional information beyond that available from other indicators, such as the number of children enrolled, and teacher qualifications.

- ***The majority of these preschool classrooms were inclusive classrooms, serving both children with special needs and children without special needs. The quality of the preschool programs did not vary with the types of special education services offered, or the specific diagnoses of the children with special needs.***

  One of the strengths of Massachusetts publicly-administered preschools is the fact that they use an inclusive model, serving both children with special needs and children without special needs in the same classroom. We found no variations in the quality of the early care and education offered to children associated with characteristics of the special education services.

- ***Per pupil expenditures in these inclusive preschool classrooms are estimated at $11,187 per year, or $21.68 per child hour, for preschool children with special needs and $3,236 per year, or $6.27 per child hour, for children in the regular education program.***

  These costs are not directly comparable to other reported costs for community-based preschool programs, because of differences in computational methods, program characteristics (part-day vs. full-day), labor force characteristics, and the prevalence of inclusive classrooms.

[3] The National Association for the Education of Young Children (NAEYC) has established a voluntary accreditation standard for early care and education. For example, NAEYC recommends that 4- to 5-year-olds should be in groups of no more than 16 to 20 children, and that staff have specialized training in child development and early education.

Ensuring that all public school preschool classrooms provide the stimulation and strong teacher-child relationships important to children's development and school readiness

There are many options to be considered, and this study was not designed to evaluate specific policies. However, the findings suggest the importance of teacher training in early childhood education, NAEYC-accreditation, and smaller group sizes and ratios. Each of these factors is important, if Massachusetts is to continue to provide high quality early care and education in the public schools, and to expand high quality early care and education to all children attending Massachusetts' public school preschools.

Massachusetts public preschools fill an important niche in the provision of early care and education – providing part-day, high quality early care and education to all children who attend public preschools, in an inclusive setting.

Public school preschool classrooms provided higher quality early care and education when: 1) teachers received training in early childhood education, beyond their formal education, 2) there were fewer children enrolled, combined with better ratios of children to instructional staff, and 3) the classroom was NAEYC-accredited.

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Early Care and Education in Massachusetts Public School Preschool Classrooms:

Full Report

Introduction

Recent research on brain development, coupled with rising concerns about school readiness, has fueled an interest in the ways in which early care and education (ECE) can support young children's cognitive and language development. The research on ECE clearly indicates that preschool classrooms can play an important role. Children who attend high quality ECE programs, particularly those programs that offer greater language stimulation, show more advanced cognitive and language development (Burchinal, Roberts, Riggins et al, 2000; NICHD ECCRN 2000).

The early years are also crucial years for the development of social skills – the ability to make friends, to get along well with others, to cooperate in group activities, to understand others' perspectives – skills that are necessary to the development of self-esteem and social relationships, and to later school success. Research has found that higher quality ECE is associated with young children's social and emotional development (c.f., Lamb 1998). The quality and stability of children's relationships with their child care providers appears to be particularly important to children's social and emotional development (c.f., Howes & Hamilton 1992, 1993; Howes, Matheson & Hamilton 1994).

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Research Questions and Study Design

Research Questions

This report addresses five research questions:

- What are the characteristics of publicly-administered, school-based preschool classrooms in Massachusetts?
- What is the quality of early care and education in these classrooms?
- Does the quality of early care and education vary by the family income of the children served?
- What classroom characteristics are linked to the quality of early care and education in school-based preschool classrooms?
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This report presents the findings from the second phase of the Massachusetts Cost and Quality Study, which examined the quality of early childhood education in school-based, publicly-administered preschool classrooms. This study was designed to provide an accurate, up-to-date picture of the quality of early care and education services for preschoolers attending these classrooms. This study was not designed to evaluate the effectiveness of specific regulations, subsidies or other policies. Nor was it designed as an evaluation of the special education component of the classrooms. Answers to these and other questions would require a different study design than that used to provide this snapshot of early care and education for preschoolers in Massachusetts public schools.

Study Design

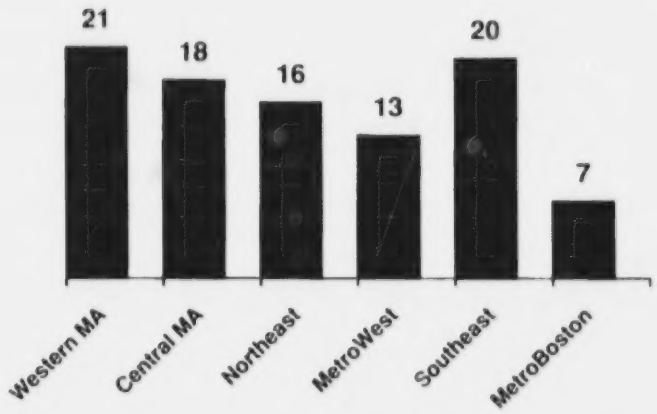
We drew a random sample of 95 school-based, publicly-administered preschool classrooms, from a list of all schools housing preschool classrooms, as reported to the Department of Education by school districts from around the state. Preschool programs that were administered by private organizations and licensed by the Office of Child Care Services, although located in school buildings, were not included in the sample frame. The majority of the selected schools (92%) both agreed to participate and were able to schedule observation visits before the end of the school year.

Most school-based, publicly administered preschool classrooms are inclusive classrooms, designed to serve both children with special needs (the children with IEPs[1]) and children who have not been identified as having special needs (referred to in this report as "peers"). We restricted this study to those classrooms serving at least eight children, and in which no more than 50% of currently enrolled children had IEPs. When a school building had more than one preschool classroom (as is the case in Early

[1] An IEP, Individualized Education Program, is developed for all children determined to have special needs that require special education services.

Learning Centers and in some other schools), we gave priority to those classrooms serving 4-year-olds, rather than 3-year-olds, and randomly selected one eligible classroom.

Figure 2: Number of Sample Classrooms in each Region of the State



Classrooms were selected from around the state. Given our sampling frame of a list of school buildings, the distribution by region reflects the regional distribution of school buildings across the state.[5] *Figure 2* shows the number of classrooms in this sample in each of the six Office of Child Care Services regions[6]: Region 1 (Western Massachusetts), Region 2 (Central Massachusetts), Region 3 (Northeastern Massachusetts) Region 4 (MetroWest), Region 5 (Southeastern Massachusetts) and Region 6 (the Boston area).

Each school's likelihood of being selected into the sample was proportional to their share of the public school preschool market. That is, their likelihood reflected the number of children enrolled in their preschool program in October of the previous school year. In our descriptive analyses, the data from each school were weighted to reflect their market share. Also, all data have been weighted to adjust for sampling probability and non-response to produce descriptive statistics representative of the entire state.

To measure the quality of early care and education, specially-trained data collectors observed classrooms for three to four hours, working with classroom teachers to select a time that was convenient for the teachers and that was typical of the usual environment for that classroom (i.e., not on a day when a field trip was planned, nor when half the class or the regular teacher was sick). At another time, data collectors interviewed teachers to gather information on their education and training. School administrators were interviewed separately, by another research team member, about classroom scheduling and staffing, staff education and training, the population served, and general classroom characteristics.

[5] For example, MetroBoston includes many early learning centers, with multiple classrooms in one building. While MetroBoston serves many preschool children, these children are served in relatively fewer buildings than in other regions. Therefore, only seven classrooms in the sample are in MetroBoston.

[6] OCCS regions are used to allow comparisons to the other types of care included in the Massachusetts Cost and Quality Study.

The Characteristics of Public School Preschool Classrooms

We found considerable variation in the ways in which school districts provided preschool education. Our sample included 95 school buildings in 81 different school systems; 6% of these school buildings housed regional preschools. Preschool classrooms were housed in elementary schools (74% of all classrooms in the sample), early learning centers (preschool and kindergarten, and sometimes first grade; 14% of sample), preschool buildings (only preschool classrooms; 2% of sample), middle schools (4%) and high schools (7%). The preschools housed in high schools included laboratory preschools that were part of the educational program for the high school students.

Early learning centers and preschool buildings housed more classrooms than did elementary schools or high schools. On average, there were eight classrooms in a typical preschool building (range 4-12), five classrooms per early learning center (range 2-13), two classrooms in each elementary school (range 1-10), three classrooms per middle school (range 2-9) and two classrooms in a typical high school (range 1-5).

Inclusive Classrooms

These preschool classrooms were sometimes funded out of the regular education budget, or with Community Partnership for Children funds, Title I funds or other grant funding. However, most of the preschool classrooms in the randomly selected schools were supported by Special Education funds. Special education funds support a range of programs, including inclusive classrooms, that is, classrooms that serve both regular education students and special education students. Inclusive preschool classrooms are expected to serve no more than 15 children at a time, and to include both typically-developing children and up to 7 children with disabilities. In our sample of schools housing publicly-administered preschool classrooms, we found that 90% of the preschool sessions were inclusive.

Classrooms vs. Sessions

Many preschool classrooms operated more than one session, serving different children in each session. For example, one classroom could operate a Monday/ Wednesday/ Friday morning session, a separate Monday/ Wednesday/Friday afternoon session, a Tuesday/Thursday morning session and a separate Tuesday/Thursday afternoon session.

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Characteristics of Observed Sessions

Up to this point, we have been describing the total program of the schools in the sample. However, we observed only one session in each school. Whenever possible we observed the morning session that operated for the greatest number of days, and that met our other eligibility requirements (at least 8 children enrolled). Among these observed sessions (which tended to be the longer sessions), About half (49%) of the sessions operated five days a week, 30% operated four days a week, 14% operated three days a week, and 7% operated two days per week. On average, sessions operated for 14.32 hours per week. Even though we over-sampled full-week and full-day sessions, the overall picture is one of sessions that are part-day, and often part-week. During recruitment of the sample, we collected information on all the sessions in the schools selected for the study. We found that only 12% of all the sessions in the selected schools were full-day (at least five hours a day). However, some schools noted that individual children attended more than one session, creating full-day programming for these individual children. Most school-based, publicly administered preschool classrooms in Massachusetts do not currently provide full-day or full-year programming.

Enrollment and Staffing

On average, 11.91 children attended the observed session and 35% of the children in a given session had an IEP. Each classroom had one primary teacher, with one or more instructional aides. In addition, inclusive classrooms (most of the sample) also had one or more specialists working with the classroom children for a combined average of 6.68 hours per week. The most common specialists were speech therapists (in 83% of the classrooms) and physical therapists (in 79% of the classrooms). Some classrooms also had children who had individual aides.

This was the first year in the observed classroom for 6% of the teachers and 12% of the instructional aides. Including these new teachers and aides, half of the teachers, and 42% of the instructional aides, had been in this classroom for fewer than 6 years. A quarter of the teachers and the instructional aides had been in this classroom between 6 and 10 years. A quarter of the teachers, and over a third of the instructional aides (38%) had been in the observed classroom for more than 10 years.

What is Quality Early Care and Education?

The quality of early care and education has been defined differently across numerous studies of the quality of care. Many studies have relied on structural indicators as the sole measure of quality. Structural measures of quality include the child-to-staff ratio (number of children per qualified classroom staff) and group size (number of children in the classroom). Studies also include staff education and specialized training. Structural indicators of quality are regulatable, and most states set minimum standards for at least some aspects of structural quality. These structural indicators have been shown to be associated with children's development (c.f., Howes 1997; NICHD Early Child Care Research Network 1999; Burchinal, Roberts, Riggins et al 2000), the ultimate indicator of quality early care and education. These characteristics are only one type of indicator of the overall quality, however, and help to set the stage for the process indicators.

A more thorough understanding of the components of quality requires an examination of what actually happens in the early care and education setting – that is, the process quality. How do adults and children interact? What materials are available for the children and how do adults support children's use of those materials? It is these aspects of the early care and education environment that scales like the Early Childhood Environment Rating Scale-Revised Edition (ECERS-R; Harms, Clifford, & Cryer 1998) have been designed to measure. These process measures tell us much more about the quality of early care and education that children receive. The process characteristics refer to the nature of the care that children experience and are often harder to measure than the structural characteristics. They include the warmth, sensitivity, and responsiveness of the caregivers, the emotional tone of the setting, the activities available to children, the developmental appropriateness of activities, and the learning opportunities available to children. These process measures of quality have been shown to be associated with children's cognitive and socio-emotional development (c.f., Helburn et al 1996). Unlike the structural indicators of quality, process indicators are not generally subject to state or local regulations.

To fully understand the quality of early care and education that children are receiving, it is necessary to understand both aspects of quality. Then, we can examine the relationship between structural and process indicators of quality to begin to address ways to ensure the quality of early care and education.

Structural Indicators of Quality

Through our observations we were able to gather information on both the structural and the process indicators of quality. Information on teacher *education* and *specialized training* in early childhood education was gathered through interviews with teachers and administrators. During the course of their observations, data collectors recorded the numbers of children and staff present at different times.[7] From this, we calculated average *group size* and average *child:staff ratio* for each classroom.

Process Indicators of Quality

To provide a comprehensive understanding of the process indicators of quality, multiple measures were used during the observation. We selected measures that have been widely used in early child care and education research as well as those used in the original Cost, Quality, and Child Outcomes Study (Helburn, 1995). It was also important to select measures that would allow us to compare the data from this study with data from other studies, to place the quality of Massachusetts' early care and education in a broader context.

The ECERS-R – Benchmarks for Early Care and Education

The main measure of quality used in this study was the Early Childhood Environment Rating Scale - Revised Edition (ECERS-R; Harms, Clifford, & Cryer 1998). The ECERS-R is a recent revision of the ECERS, which was the first in a series of rating scales developed by Drs. Harms, Clifford and Cryer for use both by practitioners and by researchers. The ECERS[8] has been widely used for a number of years, and has become one of the standards in the field, offering useful benchmarks for practitioners, researchers and policymakers. The ECERS has good predictive validity, with studies showing that ECERS scores are related to children's development (c.f., Peisner-Feinberg & Burchinal 1997; Whitebook, Howes, & Phillips 1990). The ECERS was used in the original Cost, Quality and Outcomes Study (Helburn 1995), on which this Massachusetts study is modeled. By using the ECERS, the picture we develop of early care and education in Massachusetts is directly comparable to that in other states.

The ECERS-R is a 43-item scale designed to be used in classroom-based care for children aged two to six years. The ECERS-R is organized into seven scales: Space and Furnishings, Personal Care Routines, Language-Reasoning, Activities, Interaction, Program Structure, and Parents and Staff. Each scale has additional subscales, with multiple items that must be passed to receive a given score. Each subscale is scored on a seven-point scale, with benchmarks established for 1 = "Inadequate", 3 = "Minimal", 5 = "Good", and 7 = "Excellent". Programs that pass some of the items that

[7] Only the teacher and any instructional aides were included in these calculations. We did not include individual aides or specialists in the ratios, although we do examine the impact of specialists on the quality of the early care and education in a later section of this report.

[8] "ECERS," from here and throughout refers to the ECERS-R.

are part of the benchmark for a "3", but not all of them, are scored a "2" on that subscale. Similarly, programs that fall between "Minimal" and "Good" are scored a "4", and programs that fall between "Good" and "Excellent" are scored a "6".

The ECERS-R ratings were based on observations by trained observers. Observers participated in 50-60 hours of classroom training combined with multiple practice visits to preschool classrooms. Observers were required to conduct an observation with the trainer and reach acceptable levels of agreement before collecting data on classrooms in the sample. In addition, observers conducted reliability visits in pairs. As a measure of the inter-rater reliability of the observations, we calculated the proportion of the items on which a pair of observers, observing the same classroom, agreed exactly on the ratings. On average (across all possible pairs of observers), a pair of observers reached exact agreement on 65% of the ECERS items; on average, a pair of observers agreed within one point on the seven-point scale on 84% of the ECERS items.

In the following sections, we provide an overview of the meaning of these benchmarks in the seven ECERS-R scales.

Space and Furnishings. The setting is the context in which early care and education takes place. **Inadequate** space is crowded, poorly lit and poorly ventilated, in poor repair. Settings are described as having inadequate furnishings when there is not enough basic furniture and equipment (e.g., enough chairs for all the children; soft toys and gross motor equipment, such as climbing equipment or balls, are not available) or furniture is in poor repair, and when the space is arranged in such as a way as to make it difficult for children to play – materials aren't grouped in ways that encourage children to use them, walls between areas make it difficult for staff to supervise children at play, or children do not have access to play areas apart from the main flow of the classroom.

Classrooms that provide this bare minimum – enough space and basic furniture for children and adults, adequate light and ventilation, space and furnishings in good repair and safe, some age-appropriate play equipment available – are rated as meeting **Minimal** standards. To be rated as **Good** on Space and Furnishings, a classroom must provide ample indoor and outdoor space with room for the children to move around freely; the space and furnishings must be arranged in a way that facilitates play and minimizes disruptions (for example, in well-defined activity centers – art area, blocks; trike-riding is separated from the ball-play area; quiet areas and active areas do not interfere with each other); and children's artwork or photos of recent activities must be displayed, with many items at children's eye level, among other standards.

Space & Furnishings

Classrooms are rated as **Excellent** on Space and Furnishings only if they meet all of the above standards, plus additional, higher standards, including: light and ventilation that can be controlled (windows that open; blinds that close); special furnishings such as a woodwork bench, sand/water table or art easels; accessible areas with cushions or other cozy play areas; at least five different activity areas to provide a variety of learning experiences; activity areas that are organized so that materials are nearby and children can access the materials themselves (e.g., open shelves, labeled containers); some quiet activities, for one or two children at a time, are available; projects which reflect individual children's creativity (not simply copies of adult examples) are displayed; outdoor space has some protection from the elements, convenient features such as close to drinking water, accessible storage of equipment.

Personal Care Routines Benchmarks

Personal Care Routines. A classroom is rated as **Inadequate** in Personal Care Routines if: children are often not greeted on arrival; children's departure is disorganized or parents are not allowed to bring their children into the classroom; meals and snacks do not meet USDA nutritional guidelines, children's food allergies are not accommodated, staff force children to eat, or there is a chaotic atmosphere at meal times; nap/rest times are too early or too late, or children are required to nap for more than 2 ½ hours, nap/rest times are not supervised or are supervised too harshly; toileting/diapering area is not sanitary, handwashing is often neglected after toileting; staff do not act to reduce the spread of germs (noses not wiped, diapers not disposed of properly, food preparation and toileting/diapering done near one another); smoking is allowed in child care areas; inadequate supervision to protect children's safety, several indoor or outdoor hazards that could result in serious injuries.

A classroom that meets **Minimal** standards is one in which: most children are greeted warmly on arrival and their departure is well-organized; well-balanced meals and snacks are provided in an atmosphere that is non-punitive and meets children's needs; nap times are scheduled appropriately for most children with sufficient, non-punitive supervision; the toileting schedule meets the individual needs of children, with age-appropriate supervision; and staff take action to minimize the spread of infectious diseases.

To be rated as **Good**, classrooms must: greet each child individually by name; have pleasant departure routines; welcome parents in the classroom and greet them warmly; most staff sit with the children at mealtimes; there is a pleasant social atmosphere at mealtimes and children are encouraged to eat independently with child-appropriate eating utensils; individual children's dietary restrictions are followed; at nap/rest time, staff help children to relax with soft music, cuddly toys or back rubs, the nap space is dimly lit, quiet and arranged to help children rest (cots or mats are placed for privacy, or separated by a solid barrier); when toileting/diapering, sanitary conditions are easy to maintain and there are pleasant interactions between staff and

children; staff model good health practices; children are dressed properly for conditions (dry clothes, warm clothes on cold days, aprons for messy play); staff explain reasons for safety rules to children; staff anticipate safety problems and take action to prevent problems (e.g., remove toys under climbing equipment, lock dangerous areas, wipe up spills to prevent falls).

Personal Care Routines

Classrooms are rated as **Excellent** on Personal Care Routines only if they meet these standards, plus other, higher standards, including: on arrival, children are helped to become involved in activities, if needed; staff use greeting and departure times as information-sharing time with parents; children help during meal times (e.g. set the table, wipe up spills), children use child-size serving utensils, such as small pitchers, mealtimes are used for conversations, staff encourage children to talk about things of interest to children; nap/rest schedule is flexible to meet individual needs, provisions made for early-risers or non-nappers; child-sized toilets and low sinks available, self-help skills while toileting promoted as children are ready; children taught own health practices (proper hand washing, putting on own coat or art apron); play areas arranged to avoid safety problems, children generally follow safety rules (e.g., no crowding on slides, no climbing on bookcases).

Language-Reasoning Benchmarks

Language-Reasoning. A classroom is rated as **Inadequate** in the Language-Reasoning area when there are very few books out for children to use and staff rarely read to children; staff do not use activities that encourage children to communicate (talking about drawings, dictating stories, sharing ideas at circle time, finger plays, singing songs), there are very few materials accessible that encourage children to communicate (play telephones, puppets, dolls and dramatic play props, small figures and animals); staff do not talk with children about logical relationships (staff ignore children's questions about why, do not call attention to sequence of daily events – what happens first, next – or to differences and similarity in number, size, shape; cause and effect); staff introduce concepts that are too difficult or with teaching methods that don't include concrete experiences, staff give answers without helping children to figure things out; staff talk to children primarily to control their behavior and manage routines, staff rarely respond to children's talk, children's talk is discouraged much of the day.

Classrooms that provide the bare minimum – some books accessible, at least one staff-initiated language activity daily (e.g., story-time), staff sometimes encourage children to communicate and talk about logical relationships and concepts, some concepts are introduced appropriate to the ages and abilities of the children, some staff-child conversation (e.g., short answer questions), children allowed to talk much of the day – are rated as **Minimal**.

To be rated as **Good**, classrooms must: have a wide selection of books accessible for a substantial portion of the day, organized in a reading area,

use some additional age-appropriate language materials daily, staff read books to children informally (e.g., during free play); communication activities take place during free play and group times, materials that encourage children to communicate are accessible in a variety of interest centers (e.g. in the block area, the book area, the dramatic play area); staff talk about logical relationships while children play with materials that stimulate reasoning (e.g., size and shape toys, sorting games), children are encouraged to talk through or explain their reasoning when solving problems; there are many staff-child conversations throughout the day, language is primarily used to exchange information with children and for social interaction, staff add information to expand on ideas presented by children, staff encourages communication among children.

To be rated as **Excellent** on Language-Reasoning, a classroom must meet all the above standards, plus other stricter standards, including: books and language materials are rotated to maintain interest, some books related to current classroom activities or themes; staff leave time for children to respond in conversations, balance listening and talking appropriately for age and abilities of children, link children's spoken communication with written language (e.g., write down what children dictate and read it back to them); staff encourage children to reason throughout the day, using actual events and experiences, concepts are introduced in response to children's interests or needs to solve problems; staff have individual conversations with most of the children, children are asked questions to encourage them to give longer and more complex answers (e.g., younger children are asked "what" and "where" questions, older children are asked "why" and "how" questions).

What Is the Difference Between *Good* and *Excellent*?

Sample Items on Informal Use of Language (from the Language-Reasoning Scale)

To Receive a Score of "5: Good," a Classroom Must Pass:

5.1 Many staff-child conversations during free play and routines.
5.2 Language is primarily used by staff to exchange information with children and for social interaction.
5.3 Staff add information to expand on ideas presented by children.
5.4 Staff encourage communication among children (e.g. remind children to listen to each other)

To Receive a Score of "7: Excellent," a Classroom Must Pass:

7.1 Staff have individual conversations with most of the children
7.2 Children are asked questions to encourage them to give longer and more complex answers (younger children are asked "what" or "where" questions; older children are asked "why" or "how" questions)

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Activities. A classroom is rated as **Inadequate** on the Activities scale if there are very few developmentally-appropriate materials available; if the activities available for children do not include music/movement, sand/water play, or nature/science activities, and rarely include art activities, and if TV/videos or computer games are not developmentally appropriate, or children have no alternatives to watching TV when it is on. In addition, a classroom is rated as **Inadequate** if, instead of including activities that promote acceptance of diversity, staff demonstrate prejudice towards others, and materials present only stereotypes.

A classroom is rated as meeting **Minimal** standards if some of each of the following types of *materials* are available: *small building toys*, such as Lincoln logs or Legos™, *art materials*, such as crayons and scissors, *manipulatives*, such as beads for stringing, and *puzzles*, as well as some simple musical instruments, sand toys, blocks, dramatic play materials, nature/science materials, math/number materials, and materials showing diversity in a positive way. In addition, to meet Minimal standards, a classroom must also include the following *activities*: art activities with some individual expression allowed (not just teacher-directed products); staff initiate at least one music activity daily, and some movement/dance at least weekly; children encouraged to bring in natural things to share or add to collections (e.g., fall leaves from playground); TV/video is limited to one hour daily in full-day programs, computer turns are limited to 20-minutes daily; staff intervene appropriately to counteract prejudice shown by children or other adults (for example, by discussing similarities and differences, establishing rules for fair treatment of others).

To receive a **Good** rating, a classroom must provide more of the above materials, and a greater variety of each type of material, and the materials must be organized in such a way as to facilitate children's creative use of the materials. In addition, a classroom with a Good rating uses everyday events as the basis of learning, for example, talking about the weather, discussing the change of the seasons, counting while climbing the steps.

To receive an **Excellent** rating on Activities, a classroom must meet all the above standards, plus: rotate materials regularly to maintain interest; store materials on open, labeled shelves so that children can take initiative in play; provide more elaborate or extended activities (for example, 3-D sculpture, projects that last several days; block play outdoors, bubbles in the water table, rice instead of sand, counting and recording the number of birds at the bird feeder); integrate activities across domains (for example, children making music instruments; paints available in fall colors when learning about seasons; dramatic play props linked to field trips or guests; books, computers and videos used to add information and extend children's hands-on experiences); include diversity as part of daily routines and activities (for example, foods from different cultures as regular part of meals, music from different cultures, parents encouraged to share family customs with children).

Interactions

Interactions. A classroom is rated as **Inadequate** on the Interaction scale if: supervision of children is inadequate to keep children safe; most supervision is punitive (for example, yelling, belittling children); children are disciplined severely (spanking, withholding food) or discipline is so lax that there is little order; expectations for behavior are largely inappropriate for the children's age and developmental level; staff ignore the children, staff-child interactions are unpleasant; interactions among children are not encouraged, little or no staff guidance in how to get along with other children, few positive interactions among children – teasing, bickering, and fighting are common.

What Is the Difference Between *Good* and *Excellent*?
Sample Items on Discipline (from the Interactions Scale)

To Receive a Score of "5: Good," a Classroom Must Pass:

5.1 Staff use non-punitive discipline methods effectively (Ex. Giving attention for positive behaviors; redirecting children from unacceptable to acceptable activity).
5.2 Program is set up to avoid conflict and promote age-appropriate interaction (Ex. Duplicate toys accessible, child with favorite toy given protected place to play).
5.3 Staff react consistently to children's behavior (Ex. Different staff apply same rules and use same methods; basic rules followed with all children).

To Receive a Score of "7: Excellent," a Classroom Must Pass:

7.1 Staff actively involve children in solving their conflicts and problems (Ex. Help children talk out problems and think of solutions; sensitize children to feelings of others).
7.2 Staff use activities to help children understand social skills (Ex. Use storybooks and group discussions with children to work through common conflicts).

Interactions Benchmarks

A classroom that meets **Minimal** standards for Interactions is one in which supervision is adequate to protect children's health and safety; there are some positive interactions between staff and children and staff usually respond to children in a warm, supportive manner; most supervision and discipline is not harsh and expectations for children's behavior are largely appropriate for the age and developmental level of the children; children are encouraged to interact positively, and staff interrupt negative or hurtful behaviors (name-calling, fighting).

A classroom that receives a **Good** rating is one in which: classroom staff act preventively, to remove unsafe equipment or defuse potentially dangerous situations; most staff-child interactions are positive; supervision is adjusted appropriately for age and abilities (e.g., younger or more impulsive children are supervised more closely); staff give children help and encouragement when needed; staff are aware of the whole group, even when working with one child or a small group; staff use non-punitive discipline measures effectively (giving

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attention for positive behaviors, redirecting children from unacceptable to acceptable activities); the classroom environment is set up to reduce conflict among children (enough toys, travel paths do not lead through activity areas); staff react consistently to children's behavior (basic rules followed with all children); staff show warmth and respect for children, respond sympathetically to an upset child; staff model good social skills and help children develop appropriate social behavior (help children talk through conflicts instead of fighting, help children understand the feelings of others).

To receive an **Excellent** rating, classrooms must meet all of the above standards, plus: staff engage the children to elaborate their play (talking about what they're doing, helping to set up play areas); staff maintain a balance between the child's need to explore independently and staff input into learning; when problems arise, staff involve the children in solving their conflicts (e.g., help children think of solutions), use activities such as storybooks to help children understand social skills, and seek advice from other professionals about behavior problems; staff seem to enjoy the children and encourage the development of mutual respect between children and adults (for example, staff wait until children finish asking questions before answering, encourage children in a polite way to listen when adults speak); children usually get along with each other, and staff encourage the development of these skills through group activities (e.g., painting a mural together, making soup with many ingredients).

Interactions Benchmarks

Program Structure. A classroom is rated as **Inadequate** on the Program Structure scale if: the schedule is either too rigid, with little time for individual interests or free play, or too chaotic, with little predictable sequencing of daily events or much of the day spent in unsupervised free play; children are kept in a group all day, with all children doing the same activity at the same time throughout the day; staff are not aware of children's special needs and no attempt is made to meet children's special needs or to involve children with disabilities with the rest of the group.

A classroom that meets **Minimal** standards in this area has a basic schedule that is familiar to the children; includes some outdoor and some indoor time each day, weather permitting, as well as some quiet play and some active play each day; some activities are done in small groups or individually; staff have information about children's special needs and make minor modifications to include such children; some effort is made to involve parents in setting goals and to involve children with disabilities in the ongoing activities of other children.

A classroom that meets **Good** standards is one in which the daily schedule provides a balance of structure and flexibility, with a variety of activities each day, including some that are child initiated; children do not spend long periods of time waiting between daily events; free play occurs for a substantial portion

Program Structure Benchmarks

Program Structure

of the day, with appropriate staff involvement to facilitate children's play; whole group gatherings are limited to short periods, suited to the age and needs of the children, with many activities done in small groups or individually; staff make modifications to the program so that children with special needs can participate, follow through on the recommendations of other professionals, and keep parents involved in sharing information and setting goals.

To receive an **Excellent** rating, a classroom must meet the above standards, plus: staff act to make transitions in the schedule smooth (have materials for next activity ready before current activity ends; help a few children at a time wash up for lunch, rather than the whole group at once); the schedule is flexible to respond to individual children's needs (e.g., a shorter story time for a child with a short attention span); staff use their involvement in free play as an educational interaction (e.g., help children think through solutions to problems in play); different groupings of children used throughout the day, and staff engage in educational interaction with small groups and individual children as well as with large groups; children with special needs are integrated into the larger group in most activities.

Parents and Staff Benchmarks

Parents and Staff. A classroom is rated as **Inadequate** on the Parents and Staff scale if: no written information about the program is given to parents and parents are discouraged from observing or being involved in their child's program; there are no separate areas for staff and no staff breaks; staff do not have access to a phone, storage space for materials, or separate space for individual conferences when children are in attendance; staff do not communicate with each other about children's needs, or spend time socializing with each other instead of looking after the children, or do not share duties fairly with other staff; there is no supervision or feedback provided to staff; and no in-service training or staff meetings.

To meet **Minimal** standards, programs must: provide written information about the program to parents, share child-related information between parents and staff, allow some involvement of parents and family in program, and interactions between family members and staff are generally respectful and positive; make provisions for the personal needs of staff (e.g., separate adult restrooms, at least one staff break per day) and for the professional needs of staff (access to a phone, storage space, individual conference space); provide a means for staff to share basic information about children's needs (e.g., food allergies); some staff supervision is provided, provide orientation for new staff and some in-service training, and hold some staff meetings to handle administrative concerns. In addition, staff interactions must not interfere with caregiving responsibilities and staff duties must be shared fairly.

A program that receives a **Good** rating on Parents and Staff is one in which parents are encouraged to observe before enrolling their child, and are

provided with information about the philosophy and approaches of the program; there is much sharing of child-related information between parents and staff; and parent involvement is encouraged in a variety of ways; there is a separate staff lounge (may have dual use as administrative space); three staff breaks are allowed in an 8-hour day; there is on-site, separate administrative office space and satisfactory space for conferences; staff communicate effectively and supportively with each other; an annual supervisory observation and written evaluation is conducted, noting strengths as well as areas for improvement; regular in-service training is provided; monthly staff meetings are held that include staff development activities; some professional resource materials are available on-site.

To receive an **Excellent** rating, a program must: ask parents for an evaluation of the program annually, involve parents in decision-making roles in the program along with staff; provide a separate staff lounge and some flexibility in scheduling staff breaks; have well-equipped office space for program administration and separate conference and group meeting space; provide planning time for staff working in the same classroom at least every other week; provide clear guidelines for individual staff responsibilities and promote positive interactions among staff members; involve staff in self-evaluation and offer frequent observations and feedback on staff performance, in a helpful and supportive way; provide support for staff professional development and require staff with less than an A.A. degree in early childhood education to continue formal education.

Other Measures of Quality

While the ECERS-R provides an excellent set of benchmarks for many aspects of quality, we also used additional measures that provide more specific information about caregiver behavior. These additional measures included:

- the **Global Caregiving Rating Scale** (Arnett, 1989), a 26-item scale that measures caregiver involvement and teaching style with children;
- the **Teacher Involvement Scale** (Howes & Stewart, 1987), a time-sample measure of the specific kinds of interaction that occur between a provider and a child, from ignoring to simple contact to intense contact; and
- the **ORCE Qualitative Ratings** (NICHD Early Child Care Research Network, 1996), ratings of caregiver behavior including Sensitivity/Responsiveness to Non-distressed Communication; Detachment; Intrusiveness; Stimulation of Cognitive Development; Positive Regard for the Child; Negative Regard for the Child; Flat Affect; and Sensitivity to Distress.

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As a measure of the inter-rater reliability of these observations, we calculated the proportion of the items on which a pair of observers, observing the same classroom, agreed exactly on the ratings. On average (across all possible pairs of observers), a pair of observers agreed exactly on 61% of the Global Caregiving Rating Scale items, 62% of the Teacher Involvement Scale items, and 67% of the ORCE Qualitative Ratings. The percent agreement within one point was 87%, 85% and 94% respectively.

Composites Created for This Study

Most of the results presented in this report use the ECERS-R and its component scales. However, to simplify and combine the information from the ECERS-R and the other scales described above, we used three composite variables for our analyses examining the links between structural measures of quality and process measure of quality. Three composite variables were created: **Warmth and Sensitivity**, **Engagement**, and **Stimulation**. Each of these composites was created from relevant subscales of the ECERS and the other measures described above, based on exploratory principle component analyses using the data from the first year of this study, on preschool classrooms in centers.

Warmth and Sensitivity. This composite includes the Interactions subscale of the ECERS and the Global Caregiving Ratings Scale. This composite describes how providers interact with the children in the classroom, how warm they are to the children, the amount and types of interactions that occur, and how sensitive they are to children's needs. High scores signify a classroom where providers interact often and appropriately with the children, show warmth to the children, and respond to children's needs. The Cronbach's alpha on Warmth and Sensitivity is .86, indicating a scale with high internal agreement among the component items.

Engagement. This composite includes the two items from the Teacher Involvement Scale. High scores on the Engagement composite signify a classroom where providers pay more attention to the children and seem engaged in the children's activities. The Cronbach's alpha on Engagement is .84, indicating a scale with high internal agreement among the component items.

Stimulation. This composite includes the Language-Reasoning, Activities and Program Structure subscales of the ECERS. Stimulation is a measure of the amount and variety of activities available to the children, the developmental appropriateness of the classroom structure, the amount and appropriateness of the language in the classroom, and how actively providers introduce stimulation into the environment. Higher scores signify more stimulating classrooms. The Cronbach's alpha on Stimulation is .83, indicating a scale with high internal agreement among the component items.

The Quality of Early Care and Education in Massachusetts Public Schools

Structural Indicators of Quality

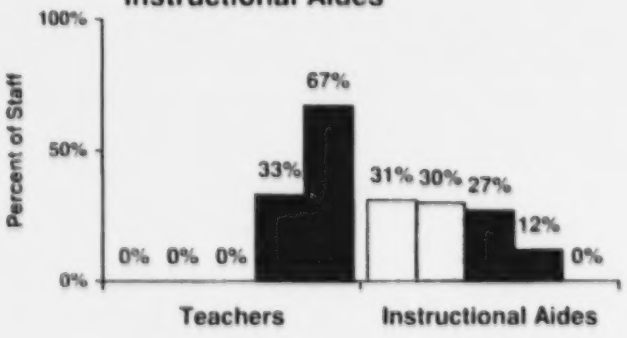
The most commonly reported measures of the structural indicators of quality are child:staff ratio, group size and teacher education and training. All of these indicators can be and are regulated by the state.

Child-to-Staff Ratios. Measuring ratios in inclusive classrooms is not as clear cut as it is in community-based preschool classrooms in full-day, full-year centers. Ratio calculations include the number of children and the number of adults. However, the inclusive classrooms often had specialists in the classroom, or specialists who would take a child out of a classroom for a portion of the day. In addition, some children with special needs had individual aides to assist them. We did not include these specialists or individual aides in our counts of ratios; rather, we included only those adults responsible for the early childhood education component of the program – the teacher and the instructional aides. While this is an imperfect descriptor of the availability of adults to the children in the classroom, it provides a useful measure of the ratio of children to adults for the early childhood education component of the program (the focus of this study), and is comparable to measures of ratios used in other types of care.

The average observed ratio of children to instructional staff, over the course of the observation time for the classrooms in our sample, was 6.73 children to every instructional staff member (including teachers and instructional aides).

Group Size. The average group size in the current study was 11.91 children in the observed session.

Figure 3: Education of Teachers and Instructional Aides



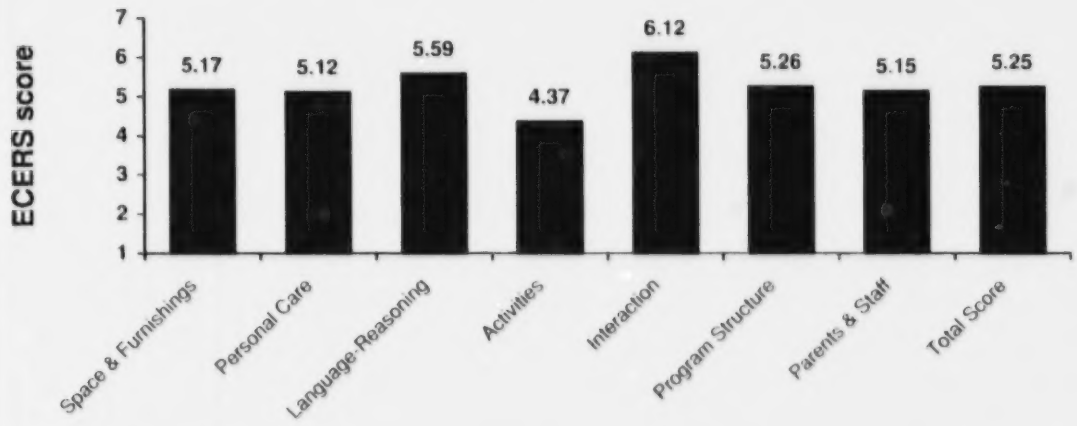
Staff Education. Staff education is another important structural indicator of quality. All teachers in school-based, publicly-administered preschool classrooms are required to have at least a 4-year college degree; 67% have a master's degree or more (see Figure 3). Instructional Aides are only required to have a high school diploma; 30% also have some college, and 39% have a 2-year college degree or more.

Process Indicators of Quality

While structural indicators tell us part of the story, process indicators of quality tell us more about what actually happens in the classroom – how stimulating the environment is, how teachers and children interact, what the materials and physical space are like, how safe it is.

The Early Childhood Environment Rating Scale (ECERS-R) is a commonly used measure of process quality that provides benchmarks for different levels of quality – as described in the previous section. These benchmarks are labeled 1 = inadequate care, 3 = minimally adequate care, 5 = good care and 7 = excellent care. Figure 4 displays the mean scores for each of the scales and for the total score for the classrooms in our sample. The average total score was 5.25, above the Good benchmark, and average subscale scores ranged from 4.37 to 6.12.

Figure 4: Average Subscale and Total ECERS-R Scores



However, averages tell only part of the story. In fact, 70% of the classrooms in the sample had total scores of five or six, meeting or exceeding the Good benchmark (Figure 5). The remaining 30% of the classrooms had scores of three or four, indicating less than good quality.

We learn more about early child and education in Massachusetts school-based, publicly-funded preschool classrooms when we examine the individual scores on each of the seven ECERS-R scales. On all but one scale, the average score was greater than five, indicating at least Good quality (Figure 5). More significantly, fully 74% of these school-based preschool classrooms met or exceeded the Good benchmark on Language-Reasoning, and 87% met or exceeded the Good benchmark on Interactions. We examine each of these scales in greater detail in the following sections.

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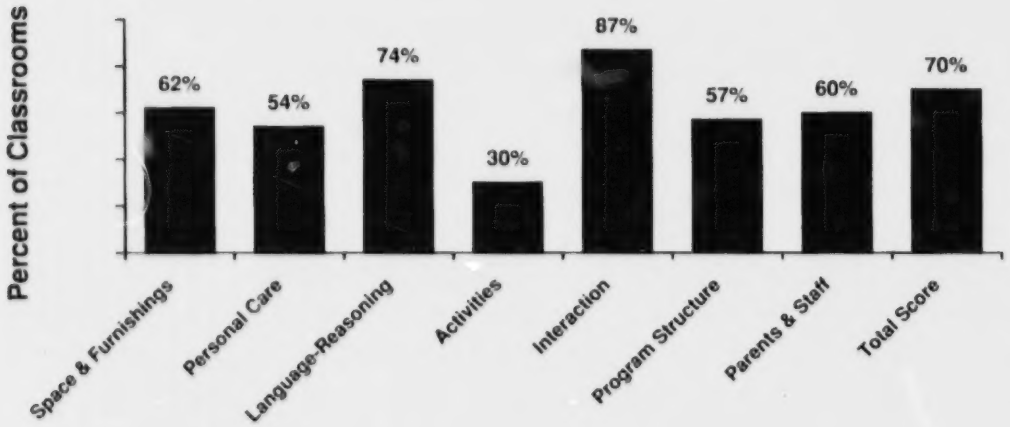
Figure 5: Percent of Classrooms Meeting Good Benchmark on ECERS-R Scales



Space and Furnishings. The average score was 5.17 on the Space and Furnishings scale – just above the Good benchmark. A total of 62% of the classrooms met or exceeded the Good benchmark (5 or higher); 38% of the classrooms did not meet the Good benchmark.

The Space and Furnishings scale is a measure of the physical setting. A classroom that meets Minimal standards is one in which there is enough space and basic furniture for children and adults, and it is in good repair; there is adequate lighting and ventilation, and some age-appropriate play equipment is available. In contrast, a classroom that meets the Good benchmark provides ample space with room for children to move around freely, and the space is pleasantly decorated with children's artwork or photos of recent activities. In addition, the space and furnishings are arranged in a way that facilitates play and minimizes disruptions with well-defined activity centers and traffic patterns that do not interfere with play.

A classroom that meets the Excellent benchmark has some climate control (windows that open, blinds that close), as well as special furnishings, such as art easels or a sand/water table, as well as quiet, cozy areas for children. In addition, the variety of furnishings in an Excellent classroom supports a range of learning experiences for the children, and furnishings are used in ways that foster children's individuality (open shelves so that children can reach materials themselves; wall-displays of children's individual art creations, rather than only copies of adult examples).

The majority of the observed classrooms received excellent ratings on the general quality of the classroom space and furnishings, and the arrangement of learning centers. However, more than half of the classrooms did not meet the Good

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benchmarks for availability of soft or cozy furnishings, space set aside for private play for one or two children, displays of children's work, or the availability of space and equipment for gross motor play.

Personal Care Routines. The average score was 5.12 on the Personal Care Routines scale – just above the Good benchmark. Fifty-four percent scored between Good and Excellent; 46% did not meet the Good benchmark.

The Personal Care Routines scale is a measure of the quality of care routines for meals, naps, and toileting, as well as behaviors at arrival and departure. A classroom that meets Minimal standards is one in which most children are greeted warmly on arrival and their departure is well-organized, and children's personal care needs are attended to in a non-punitive manner, and at scheduled times that meet the needs of most or all of the children.

A classroom that meets the Good benchmark goes beyond this. Staff greet children individually by name on arrival, and have pleasant departure routines. Personal care routines are designed not just to meet basic needs, but to allow pleasant social interactions between staff and children, and among the children. At snack time, most staff sit with the children, and children are encouraged to eat independently with child-appropriate utensils. At nap times (if any), staff help children to relax, with soft music, cuddly toys or back rubs, and the nap space is quiet and arranged in a way that helps children to rest. Staff also model good health practices around personal care routines (washing hands, wiping noses, covering mouth when coughing).

In a classroom that meets the Excellent benchmark, staff help children to get involved in activities when they first arrive, if needed. Personal care routines are used as an opportunity to develop children's social skills and for conversation about things of interest to the children. Personal care routines are also individualized: the nap schedule is flexible enough to meet individual children's needs with provisions for early risers or non-nappers; serving pitchers at meal-times are child-size so that children can serve themselves, bathrooms have child-sized toilets and low sinks so that children can develop autonomy in toileting.

The majority of the observed classrooms received excellent ratings on greeting and departure routines, toileting and safety practices. However, more than half of the classrooms did not meet the Good benchmarks for snack time and for health practices.

Language-Reasoning. The average score was 5.59 on the Language-Reasoning scale of the ECERS-R – above the Good benchmark. Almost three-quarters (74%) of the classrooms in the sample were rated as Good quality or better on Language-Reasoning.

The Language-Reasoning scale is a measure of the books available for the children, how those books are used, and the communication and language skills that are used and encouraged in the setting. A score below five (Good) on this scale indicates a

classroom that does not have a wide variety of books and other language materials available to the children for a large portion of the day and where staff do not frequently encourage communication and reasoning skills. For example, a classroom that meets Minimal standards on the Books and Pictures item of this scale has some books available for the children and at least one daily staff-initiated receptive language activity such as storytelling.

On the other hand, to meet the Good benchmark, a classroom must have other language materials such as flannel boards or picture card games available, the books and other language materials must be developmentally appropriate, and staff must read to children informally rather than only at scheduled times. Thus, for a rating of Good, there are not only more materials required but also the staff must integrate language and reasoning skills into all areas of the program. To receive an Excellent rating, classroom staff must also link children's spoken communication with written language (for example, by writing down what children tell them about their paintings), and encourage children to reason throughout the day, using actual events and experiences, and questions that encourage children to give more complex answers (e.g., younger children are asked "what" and "where" questions, older children are asked "why" and "how" questions).

The majority of the observed classrooms received excellent ratings on encouraging children to communicate, and the informal use of language. However, more than half of the classrooms did not meet the Good benchmarks on the availability and use of books and language materials, or for the use of language to develop reasoning skills.

Activities. The average score on the Activities scale was just over a four (4.37) – Minimal to Good quality. In all types of early care and education programs, the *Activities* scores tend to be lower than other subscale scores, because some of the items for the Good benchmark require a range of daily activities that only a few programs offer.

Only 30% of the classrooms had a score of Good or better. The Activities scale is a measure of the types and variety of materials and activities available for the children such as fine motor materials, art, music, sand & water play, and dramatic play. A score below five (i.e., not meeting the Good benchmark) indicates a classroom that is lacking in many of these activities and materials. A classroom rated as Good provides a greater range of materials and activities, and uses everyday events as the basis for learning, for example, talking about the change of seasons, counting while climbing the steps. To meet the Excellent benchmark, a classroom needs to provide more opportunities for elaborate or extended activities, and have integrated activities across domains (for example, making musical instruments as an art project, having paints available in fall colors when talking about the seasons, including props in the dramatic play area that are linked to field trips or guests). In addition, to meet the Excellent benchmark, classrooms must include diversity as part of daily routines and activities.

Interactions. The average score was 6.12 on the Interactions scale – well above the Good benchmark. A total of 87% of classrooms met the Good benchmark (a score of 5 or higher).

The Interactions scale is a measure of the quality of interactions between staff and children, and among the children themselves. A classroom that meets Minimal standards is one in which staff supervision is adequate to keep the children safe, there are some positive interactions between staff and children, without the use of harsh discipline styles, and children are encouraged to interact with each other in a positive manner.

A classroom that meets the Good benchmark goes beyond this, with staff acting preventively to avoid unsafe situations, paying attention to the whole group even when working with a small group or an individual child, using such non-punitive discipline methods as redirecting children from unacceptable to acceptable behaviors, showing warmth and respect for the children, and modeling good social skills. In a classroom that meets the Excellent benchmark, staff interact with children to elaborate their play, by talking about what they're doing or helping to set up play areas, while maintaining a balance between the child's need to explore independently and the benefits of staff input to children's play. Staff also take an active approach to children's social skills development, by using activities such as storybooks to help children understand social skills, and helping children practice the skills of conflict resolution, empathy and cooperation through group activities, such as making soup with many ingredients. In addition, a classroom with an Excellent rating is one in which the children usually get along with each other and staff seem to enjoy the children.

The majority of the observed classrooms received excellent ratings on most or all of the items. However, 13% of the classrooms did not meet the Good benchmark on interactions.

Program Structure. The average score was 5.26 on the Program Structure scale – just above the Good benchmark. A total of 57% of the classrooms met the Good benchmark (a score of 5 or higher); 43% did not meet the Good benchmark.

The Program Structure scale is a measure of the predictability and variability of the structure of daily activities. A classroom that meets Minimal standards has a basic schedule that is familiar to the children, and includes some variety of activities throughout the day, including some time in small groups or in individual activities. In contrast, a classroom that meets the Good benchmark balances structure and flexibility in the daily schedule, with more time spent in small groups or individual activities, including some activities that are child-initiated. Staff are involved in children's play appropriately, and make modifications as needed so that children with special needs can participate. A classroom that meets the Excellent benchmark is flexible enough to respond to individual children's needs, and structured in ways that reduce the time that children wait between activities. In addition, different types of activities, including free

play, individual and small group times, as well as whole group times, are used to further children's learning and development.

The majority of the observed classrooms received excellent ratings on the appropriate use of group time and on provisions for children with disabilities. However, more than half of the classrooms did not meet the Good benchmark on the availability of periods of free play both indoors and outdoors, weather-permitting. In addition, the majority of classrooms did not meet the Minimal benchmark for a familiar program schedule that includes indoor and outdoor play, weather-permitting, as well as both gross motor and less active play daily.

Parents and Staff. The average score was 5.15 on the Parents and Staff scale – just above the Good benchmark. A total of 60% met or exceeded the Good benchmark. The Parents and Staff scale is a measure of the quality of communication between staff and parents, of the working environment for staff, and of professional development support for staff. A program that meets Minimal standards is one in which programs provide written information about the program to parents, share child-related information between parents and staff, and one in which interactions between parents and staff are generally respectful and positive. The Minimal work environment is one in which staff have a separate adult bathroom, and at least one break per 8-hour work day, with access to a telephone, storage space, and individual conference space. Staff also receive some staff supervision and in-service training, and attend some staff meetings to handle administrative concerns.

A classroom that meets the Good benchmark is one in which there is more extensive involvement of parents/guardians, including the sharing of information about the philosophy and approaches of the program. In addition, staff communicate effectively and supportively with each other, with monthly staff meetings that include staff development activities. Staff have a staff lounge area (which may be shared with administrative space) and three breaks in an 8-hour day, plus an annual supervisory observation and written evaluation, as well as regular in-service training. To receive an Excellent rating, a program would involve parents in decision-making roles in the program along with staff, and annually ask parents to evaluate the program. The program would also provide staff with clear guidelines for their individual responsibilities, involve staff in self-evaluation and offer frequent observations and feedback to staff, and provide separate administrative space, as well as conference and group meeting space. Finally, a program with an Excellent rating would provide support for staff professional development and require that staff with less than an A.A. degree in early childhood education continue their formal education.

The majority of the observed classrooms received excellent ratings on the provisions for the professional needs of staff (space for storage, meetings, program administration), and on staff interaction and cooperation. However, more than half of the classrooms did not meet the Good benchmark on provisions for the personal needs of staff (such as breaks and space for personal belongings), and opportunities for professional growth.

The majority of classrooms met or exceeded the Good benchmarks for provisions for parents and the supervision and evaluation of staff.

Does the Quality of Early Care and Education Vary by Family Income?

School personnel were not able to provide information about family income of the children enrolled in the observed classrooms. Instead, we asked school administrators whether or not the preschool programs in the school building participating in the study also participated in the Child and Adult Care Food Program (Child Care Food Program) or the School Lunch or School Breakfast Program,[6] and, if so, what proportion of the children in the preschool program (in all sessions) were eligible for the free or reduced-price meals.[7] We then categorized the sample according to the proportion of children participating in the food program.

At 47% of the schools we visited, none of the preschool children participated in the Food Program; at 31% of the schools fewer than half of the children participated; at 22% of the schools, more than half of the children participated. This is an imperfect measure of the family incomes of children attending different preschool programs, since many preschool children do not stay for lunch and, therefore, the program's non-participation in the Food Program may simply reflect the length of the program day and other features of the program unrelated to family income. However, this measure does identify some of the programs in which high proportions of children were income-eligible for one of the food programs. We view this measure as allowing us to identify programs that definitely serve low-income children (the 22% of the sample where more than half of the children participated in the Food Program), and to compare these programs to other programs in the state, which may or may not serve low-income children.[8]

We tested whether the scores on the total ECERS-R or on any of the subscales of the ECERS-R were significantly different for the three categories of schools [no participants, some participants, more than half participating in the Food Program], and found no significant differences. *Figure 6* shows the average total ECERS-R scores for the three categories of schools. Even with an imperfect measure of family income, we found that those programs with an identified 50% or more of preschool children who are eligible for one of the food programs had an ECERS-R score comparable to the total sample score of 5.25, suggesting that lower income children, on average, receive early care and education of quality comparable to that received by other children in these publicly-funded public school classrooms. While the early care and education is of comparable

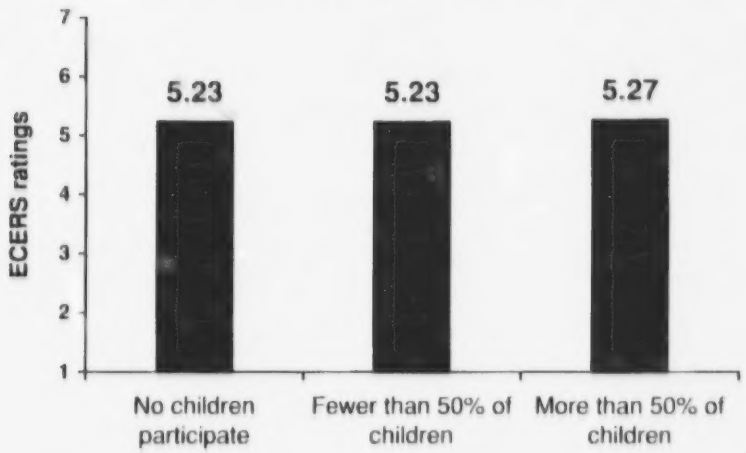
[6] In 2001, a family of three with an annual income of $19,019 or less (130% of the federal poverty line) was eligible for the free meals program; a family of three with an annual income of $27,066 or less (185% of the federal poverty line) was eligible for the reduced price meals program. http://www.fns.usda.gov/cnd/Lunch/Governance/Notices/01-02.iegs.pdf

[7] It is important to note that our proxy measure of family income is at the program or building level – that is, it reflects the income of all children in all preschool sessions in that building – while our quality measure is only available for one of those sessions.

[8] We considered categorizing programs by the income levels of communities, but not all children in a community attend the public preschools – which meant that we could not determine the income levels of the children attending the public preschools even if we knew the income levels of the community.

quality, there is room for improvement for many individual classrooms across the state, given that 30% of classrooms did not meet the Good benchmark on the ECERS-R.

Figure 6: Average ECERS-R by Food Program Participation



Characteristics Related to the Quality of Early Care and Education in Public School Preschool Classrooms

As we noted earlier, there are two main aspects of quality of care that we measured: structural and process. Many of the structural aspects of quality can be and are regulated by states. Process characteristics are not easily regulated but help us to understand the environments in which children spend their time, and are directly related to children's development. To the extent that regulatable structural indicators of quality are related to process quality – to what happens in the classroom – regulations can improve children's outcomes. To understand how such regulatables are related to process, we examined the relationship between several structural variables and our summary or composite process measures: stimulation in the classroom, the warmth and sensitivity of the teacher-child relationship, and the teacher's engagement in the classroom.

We first examined three structural variables:

- child:staff ratio;
- group size; and
- teacher education and training[9].

Regulatables and Stimulation

We examined the relationships between the structural variables and the quality of the stimulation provided in the classroom. The *Stimulation composite* is a sum of the Language-Reasoning, Activities and Program Structure subscales of the ECERS. The Stimulation composite is a measure of the amount and variety of activities available to the children, the developmental appropriateness of the classroom structure, the amount and appropriateness of the language in the classroom, and how actively classroom staff introduce stimulation into the environment. Higher scores indicate more stimulating classrooms.

Table 1 reports the estimates of the extent to which an increment in each of these structural variables is associated with an increment in the observed stimulation provided in school-based preschool classrooms in Massachusetts. Because the estimates are standardized, they can be compared to each other, both within each model, and across models.

[9] We used four different measures of teacher education and training: a degree in Early Childhood Education (ECE), a degree in Special Education (SPED), any Community Partnerships for Children (CPC) training in ECE, and any CPC training in SPED. Because these measures are somewhat related to each other, we estimated four different models, one for each of these education/training measures. CPC training in ECE was the only education/training variable that was significantly related to quality, after considering ratios and class size. Therefore, we present only the models using CPC training in ECE as the education/training variable.

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The table reports the significance level (p) of each estimate, that is, the probability that this estimate is not a valid estimate of the population of all full-day preschool classrooms in Massachusetts. For example, an estimate significant at the $p < .05$ level has five chances in 100 of not being valid. Put another way, that same estimate has 95 chances out of 100 of being a valid estimate of the population. In this report, we treat as significant those estimates that have at least 90 chances out of 100 of being valid ($p < .10$). The table also reports the R^2 for each model (column); R^2 indicates the proportion of the variation in the process quality measure that is explained by all of the listed regulatables combined.

Table 1: Standardized Estimates of Relationships Between Regulatables and Quality Composites (N = 92)

	Stimulation	Warmth and Sensitivity	Engagement
Child:Staff Ratio	-.08	-.22 ^	-.32 **
Group Size	-.10	-.01	.25 *
CPC training in early childhood education	.31 **	.16	.17
R^2	.14 **	.10 *	.18 **

^ = $p < .10$, * = $p < .05$, ** = $p < .01$

As Table 1 shows, classrooms in which teachers had participated in Community Partnerships for Children (CPC) training in early childhood education scored higher on Stimulation. Teachers' formal education was not a significant predictor of the level of stimulation provided (data not shown); this is not surprising, given the fact that all teachers at a four-year college degree and 67% had masters' degrees, leaving little variation in the level of formal teacher education. What made a difference across classrooms was whether or not teachers had additional training, provided by CPC, in early childhood education. CPC training in special education was not related to scores on these measures of early care and education (data not shown), but may be related to measures of proficiency in special education. These findings suggest the added benefit of training specific to the services offered (early childhood education), above and beyond the high levels of education that all teachers hold.

Regulatables and the Teacher-Child Relationship

We also examined the relationships between regulatables and specific aspects of teachers' interactions with children (see Table 1). The *Warmth and Sensitivity composite* includes the Interactions subscale of the ECERS and the Global Caregiving Ratings Scale score. The Warmth and Sensitivity composite describes how providers interact with the children in the classroom, how warm they are to the children, the

amount and types of interactions that occur, and how sensitive they are to children's needs. High scores signify a classroom where providers interact often and appropriately with the children, show warmth to the children, and respond to children's needs.

As Table 1 indicates, the most important predictor of the level of observed warmth and sensitivity is the child-staff ratio, significant at $p < .10$ in this model – the fewer children per adult, the more warmth and sensitivity the children experience. The ratios are based on counts of the number of children and number of instructional staff actually present in the classroom at randomly-determined observation intervals – not temporarily escorting a child to the bathroom or to a specialist, for instance. In school-based, publicly-administered preschool classrooms that typically have one teacher present, variations in these ratios reflect the number of children enrolled, the number of instructional aides assigned to the classroom, and the general pattern of adult presence over the course of the observation. Relatively fewer children, and a greater presence of instructional aides, help to raise the warmth and sensitivity of the relationship between children and adults in the classroom.

Table 1 also reports the results for Engagement. The *Engagement composite* consists of two items from the Teacher Involvement Scale. High scores on the Engagement composite indicate a classroom where instructional staff pay more attention to the children and seem engaged in the children's activities. Again, we find that child:staff ratio is a significant predictor of the level of engagement of staff with the children. Interestingly, group size is also a significant predictor, over and above ratio. Together, these findings suggest that engagement is particularly sensitive to the number of children present – fewer children means greater levels of engagement.

NAEYC Accreditation

The National Association for the Education of Young Children (NAEYC) has established a voluntary accreditation standard for early care and education. For example, NAEYC recommends that 4- to 5-year-olds should be in groups of no more than 16 to 20 children, and that staff have specialized training in child development and early education. The Department of Education, through the Community Partnerships for Children program (CPC), has encouraged school-based preschool classrooms to become NAEYC-accredited. Forty percent (40%) of the classrooms in this study were NAEYC-accredited.

We examined whether NAEYC accreditation was associated with higher levels of process quality in this study. As Table 2 indicates, classrooms that were NAEYC-accredited scored higher on warmth and sensitivity, even after considering variations in child:staff ratios, than did non-accredited classrooms. NAEYC accreditation was also significantly related to the level of stimulation in the classroom, along with teacher training in early childhood education. NAEYC-accreditation appears to raise the quality of both the academic stimulation provided, and the relationship between the teacher

and children, above and beyond the effects of teacher training, teacher:child ratios and class size.

Table 2: Standardized Estimates of Relationships Between NAEYC Accreditation and Process Quality measures (N = 92)

	Stimulation	Warmth & Sensitivity	Engagement
Child:Staff Ratio	-.10	-.24 *	-.32 **
Group Size	-.06	.05	.25 *
CPC Training	.23 *	.07	.18
NAEYC Accreditation	.19 ^	.23 *	-.01
R^2	.17 **	.17 *	.16 **

^ = $p < .10$, * = $p < .05$, ** = $p < .01$

Inclusive Classrooms and the Quality of Early Care and Education

The vast majority of the observed sessions were in inclusive classrooms; during 93% of the observed sessions children with special needs were present. We examined whether specific characteristics of inclusive classrooms where associated with variations in the quality of the early care and education the children received.

Children's diagnoses. Children with Individual Education Programs (IEP's) varied in their specific diagnoses, and classrooms would be expected to vary in their programming for children with different diagnoses. The most common diagnosis was 'developmental delay'; more than half (57%) of the classrooms included children with developmental delay. About a third of the classrooms (36%) included children with a diagnosis other than developmental delay. As Table 3 shows, classrooms with children with other diagnoses did not differ in the quality of the early care and education offered from classrooms serving children with developmental delay or no diagnosed disability.

Table 3: Standardized Estimates of Relationships Between Children's Diagnoses and the Quality composites (N = 92)

	Stimulation	Warmth & Sensitivity	Engagement
Child:Staff Ratio	-.10	-.21	-.35 *
Group Size	-.08	.02	.31 *
CPC Training	.29 **	.15	.15
Diagnoses Other Than Developmental Delay	.09	.12	.02
R^2	.15 **	.11 *	.16 **

^ = $p < .10$, * = $p < .05$, ** = $p < .01$

Availability of specialists. Children with IEPs received additional services from special education specialists. It is possible that the availability of specialists could be related to the observed quality of the early care and education. However, as Table 4 indicates, the number of hours a specialist spends with one or more children in an inclusive classroom is unrelated to the quality of the early care and education the children receive, after considering ratio, group size and teacher training.

Table 4: Standardized Estimates of Relationships Between the presence of Specialists and Quality Composites (N = 92)

	Stimulation	Warmth & Sensitivity	Engagement
Child:Staff Ratio	-.12	-.23 ^	-.37 **
Group Size	-.06	.04	.32 *
CPC Training	.32 **	.17	.16
Number of Hours By Specialists	-.12	-.13	.04
R^2	.18 *	.12 *	.16 **

^ = $p < .10$, * = $p < .05$, ** = $p < .01$

The Cost of Early Care and Education in Massachusetts' Public Schools

As part of the Massachusetts Cost and Quality of Early Care and Education Study, we have compiled some basic information on the cost of early care and education for programs that are part of the public school system. It is important to note that computing the cost of these programs involved a different process and different issues than those associated with computing the cost of care in community centers serving preschool-aged children (see Marshall, Creps, Burstein, Glantz, Robeson & Barnett, 2001. *The Cost and Quality of Full Day, Year-round Early Care and Education in Massachusetts: Preschool Classrooms*).

Collecting data and computing cost. To compute the cost of care in community-based programs, we conducted in-depth interviews with center directors or owners about all of their costs and expenditures for a given year. From these data, we were able to compute the full cost of care for each center. Computing costs for programs in the public school system was done much differently. In public school systems, program coordinators and principals function differently than directors of community centers, and it is unlikely that we could have gathered comparable (or even complete) cost information through interviews with them. Instead, we relied on the cost data provided by The Massachusetts Department of Education (DOE). DOE has established reporting requirements for all programs, including financial information. Therefore, we relied on the information gathered by DOE in FY 2000. While this information is not directly comparable to the cost information gathered in the community preschool sample, it does provide some indication of cost.

Part-day vs. full-day. The community preschool sample included only those centers that operated full-day programs; part-day programs were excluded. On the other hand, preschool programs in the public school system are primarily part-day and are often part-week as well.

Labor costs. Although labor is the largest single expenditure for both community-based preschool programs and public school preschool programs, the labor costs in the two types of programs reflect differences in [1] teacher qualifications (for example, all public school teachers are required to have a bachelor's degree, while community-based preschool teachers are not), [2] teacher salaries for teachers with the same levels of education, and [3] the paid benefits offered to teachers and other instructional staff in community-based preschool programs versus public school preschools.

Special education for preschoolers. Most of the public preschool programs included in this report were inclusive classrooms. Inclusive classrooms provide both regular education and special education, and serve both preschoolers with special

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needs and IEPs, as well as students without IEPs. Inclusive classrooms therefore incur both instructional costs and special education costs such as speech therapy and other specialists. In contrast, the majority of the classrooms in the community preschool study were not inclusive classrooms and most had no special education children. Therefore, the costs associated with the two types of classrooms are quite different.

Level of detail. Because we gathered the data ourselves for the community programs, we were able to report costs for each of the following categories: labor, occupancy, food, and other. A comparable level of detail was not available for the programs in the public school system.

Expenditures vs. full costs. Expenditures comprise actual outlays over the course of a year. These are typically less than the full costs incurred for early care and education, because many programs are able to obtain resources – especially space – at below-market rates. Their operations may be subsidized in other ways as well, for example, through volunteer labor or the receipt of goods and services from parent organizations (i.e., the school system, in the case of public school preschools, or the larger organization, in the case of community centers). *Full costs* include the true cost of these additional resources. It is important to consider full costs as well as expenditures. If one wants to expand early care and education slots by replicating existing programs, one should expect to pay the true market cost for inputs. While the DOE does allocate some district-level expenses to individual programs, the accounting of full-costs for the DOE cost data is different from our estimates of full-costs for community programs; therefore, the cost estimates may not be directly comparable.

Costs for Inclusive Preschool Classrooms in Public Schools

To compute the estimate of per-child hour of early care and education, we relied on data compiled by the DOE Office of School Finance, from the *Pupil and Financial Report from FY 00.* [10] In the *Pupil and Financial Report*, per pupil expenditures for FY 2000 (the 1999-2000 school year) have been calculated from information provided on each school district's End of Year Pupil and Financial Report.

Programs vary in the number of children served and in hours of operation. Program costs obviously vary with these factors as well. For comparability, all costs have been expressed in terms of dollars per child hour. The average public school preschool program serves children for 14.32 hours per week, for 36 weeks per year, for a total of 516 child hours per school year.

Per pupil expenditure information is included in the *Pupil and Financial Report* for each school district based upon its programmatic offerings in any of the regular, special, bilingual and occupational education programs available to school children. For this report on early care and education in Massachusetts public schools, we are interested

[10] Source: http://finance1.doe.mass.edu/statistics/pp00.html

in the per pupil expenditures for children attending preschool classrooms. These expenditures are reported in two sections of the *Pupil and Financial Report from FY 00:* per pupil expenditures for preschool children with IEPs are reported in the section on expenditures for special education programs, under prototype 502.8[14]; per pupil expenditures for preschool children who do not have IEPs are reported in the section on expenditures for regular day programs.

Per pupil expenditures for preschool children with IEPs. When school districts report their expenditures for prototype 502.8, the special education per pupil expenditure is based on a composite of time spent in regular and special education. In FY00, the average per pupil expenditure for students in 502.8 classrooms was $11,187, or $21.68 per child hour.[15] Because special education costs are reported separately by prototype, this estimate does not include the costs of children served in substantially-separate classrooms, in home-based programs, or in residential schools.

Per pupil expenditures for preschool children without IEPs. The per pupil expenditure for preschool children in the regular education program is reported under the expenses for regular day programs; in FY00, the average per pupil expenditure was $3,236, or $6.27 per child hour.

[14] This prototype is designed for three- and four-year olds with disabilities.

[15] We do not recommend trying to estimate what portion of these expenditures is for the regular education component for children with IEPs, because these services are delivered in the context of an inclusive program model, the purpose of which is to integrate special education and regular education, not separate them.

Ensuring the Quality of Early Care and Education in Public School Preschool Classrooms

One of the objectives of the Massachusetts Department of Education has been to combine regular preschool education with special education, in inclusive classrooms that offer high quality early care and education (Schaefer 2002). This study provides a picture of the quality of early care and education in Massachusetts public school preschool classrooms. Ninety percent of the observed classrooms were inclusive classrooms.

It is important to note that most of these preschool programs were not designed to provide child care for employed parents. Most of the preschool sessions operated part-day, and many were part-week; only 12% of the programs in the sample included sessions that operated for at least 5 hours per day.

What Is the Quality of Early Care and Education in Massachusetts Public School Preschools?

We found that the majority of the preschool classrooms in public schools in Massachusetts provide high quality early care and education. Three-quarters of the classrooms met or exceeded the Good benchmark on language and reasoning stimulation, and 87% met or exceeded the Good benchmark on social interactions. This high level of quality, in part, reflects the standards for teacher education in this state – every public school preschool teacher must have a 4-year degree, and 67% of the teachers in this sample had a master's degree. We also found that the level of quality for programs serving lower income children was comparable to that of other programs in the state.

At the same time, a significant proportion of preschool classrooms failed to meet the Good benchmarks for quality early care and education: 26% failed to meet the Good benchmark on language/reasoning stimulation; 13% failed to meet the Good benchmark for social interactions. In addition, 40% failed to meet the Good benchmark for supports for parents and staff and 38% failed to meet the Good benchmark for space and furnishings used in the program.

What Is Needed to Improve in These Areas?

All the preschool classrooms had the basics in space and furnishings, but programs that met the Good benchmark in this area also had ample room for children to move around freely, including opportunities for gross motor play, and the space was used in ways that facilitated play and minimized disruptions, with well-defined activity centers and traffic

patterns that did not interfere with play. Sixty-two percent of programs met these standards, but 38% failed to meet one or more of these standards.

Programs that met the Good benchmark for supports for staff included staff development activities in monthly staff meetings, provided regular in-service training, and allowed three breaks in an 8-hour day. Sixty percent of programs met these standards for staff, but 40% of the programs failed to meet one or more of the standards.

Ensuring that All Preschool Classrooms Provide the Stimulation and Strong Teacher-Child Relationships Important to Children's Development and School Readiness

There are many options to be considered, and this study was not designed to evaluate specific policies. However, our analyses of the characteristics of classrooms and teachers that are associated with quality suggest what is needed to continue to ensure that Massachusetts provide high quality early care and education in school-based, publicly-administered preschool classrooms, and to expand this high quality early care and education to all children attending Massachusetts public school preschools.

First, we found that additional training in early childhood education beyond formal education, such as the training provided by CPC, raises the level of stimulation provided to children. However, formal education and training are not enough to ensure a warm, sensitive and engaged relationship between teacher and child. This study found that having fewer children in the classroom, as well as better ratios (a combination of fewer children and more hours of instructional staff time), was associated with greater warmth and sensitivity and greater teacher engagement with the children. In addition, we found that classrooms that were NAEYC-accredited scored higher on both stimulation and on warmth and sensitivity.

Classrooms provided higher quality early care and education when: 1) teachers were trained in early childhood education, 2) there were fewer children enrolled, combined with better ratios of children to instructional staff, and 3) the classroom was NAEYC-accredited.

Inclusive Settings: A successful model for all children

One of the important characteristics of Massachusetts' public preschool classrooms is the fact that they are inclusive, that is, they include children with special needs. We found that the quality of early care and education offered in these inclusive classrooms met the standards for quality set by the early care and education field, and that the quality of early care and education was not influenced by the inclusion of children with special needs and the related special education services. However, we did find that the

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cost of public preschool education in Massachusetts reflects the fact that these are inclusive programs, with the costs for children with special needs more than three times the costs for other children.

In addition, we examined whether low-income children received early care and education of a quality comparable to that received by other children. Although our measure of family income is imperfect, our findings suggest that low-income children are as likely to receive high quality care and education as other children attending public preschools.

Massachusetts public preschools fill an important niche in the provision of early care and education – providing part-day, high quality early care and education to all children who attend public preschools in inclusive settings.

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